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GenCore version 5.1.6
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OM protein - protein search, using sw model

Run on: June 18, 2003, 03:16:37 ; Search time 37.9222 Seconds
(without alignments)
1215.770 Million cell updates/sec

Title: US-09-807-933B-11
Perfect score: 1895
Sequence: 1 MKFSIIASALLLAASSTYAA.....TFKAVTCPAEIIAKTGCERK 346

Scoring table: BLOSUM62
Gapop 10.0 , Gapext 0.5

Searched: 908470 seqs, 133250620 residues

Total number of hits satisfying chosen parameters: 908470

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

Database : A_Geneseq_101002:*
1: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA1980.DAT:*
2: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA1981.DAT:*
3: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA1982.DAT:*
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9: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA1988.DAT:*
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19: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA1998.DAT:*
20: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA1999.DAT:*
21: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA2000.DAT:*
22: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA2001.DAT:*
23: /SIDS2/gcgdata/geneseq/geneseqp-embl/AA2002.DAT:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	% Query Match	Length	DB	ID	Description
1	1895	100.0	346	21	AAB09826	Endoglucanase prot
2	1895	100.0	346	23	AAO15057	Phycomyces nitens
3	1895	100.0	346	23	ABB08065	P. nitens CP99002
4	1197	63.2	338	21	AAB09824	Endoglucanase prot
5	1197	63.2	338	23	AAO15055	Rhizopus arrhizus
6	1197	63.2	338	23	ABB08063	M. circinelloides
7	1194	63.0	360	21	AAB09823	Endoglucanase prot
8	1194	63.0	360	23	AAO15054	Rhizopus arrhizus
9	1194	63.0	360	23	ABB08062	R. oryzae CP96001
10	1170.5	61.8	387	21	AAB09825	Endoglucanase prot
11	1170.5	61.8	387	23	AAO15056	Rhizopus arrhizus
12	1170.5	61.8	387	23	ABB08064	M. circinelloides
13	1106	58.4	338	21	AAB09821	Endoglucanase prot
14	1106	58.4	338	23	AAO15052	Rhizopus arrhizus
15	1106	58.4	338	23	ABB08060	R. oryzae CP96001
16	1069	56.4	366	21	AAB09822	Endoglucanase prot
17	1069	56.4	366	23	AAO15053	Rhizopus arrhizus
18	1069	56.4	366	23	ABB08061	R. oryzae CP96001
19	879	46.4	245	23	AAO15063	Endoglucanase-rela
20	855	45.1	228	23	AAO15062	Endoglucanase-rela
21	698.5	36.9	306	19	AAW44270	Hybrid DNA protein
22	696.5	36.8	200	19	AAW53967	Sordaria fimicola
23	689	36.4	223	23	AAO15070	Humicola insolens
24	689	36.4	223	23	AAG80602	Humicola insolens
25	687.5	36.3	200	19	AAW53979	Thielavia terrestr
26	686.5	36.2	299	17	AAW04928	Cellulytic enzyme
27	686.5	36.2	299	19	AAW63624	Monocomponent endo
28	683.5	36.1	202	19	AAW53972	Macrophomina phase
29	683.5	36.1	222	17	AAW04929	Cellulytic enzyme
30	683.5	36.1	225	21	AAY84798	Amino acid sequenc
31	683.5	36.1	225	22	ABB05057	Chrysosporium C1 s
32	683.5	36.1	294	17	AAW04937	Chimeric endogluca
33	681.5	36.0	304	19	AAW44272	Hybrid DNA protein
34	680	35.9	349	17	AAW04927	Cellulytic enzyme
35	679.5	35.9	200	19	AAW53968	Thielavia terrestr
36	678.5	35.8	225	17	AAW04925	Cellulytic enzyme
37	678.5	35.8	297	17	AAW04933	Chimeric endogluca
38	678.5	35.8	308	17	AAW04934	Chimeric endogluca
39	672.5	35.5	204	19	AAW53970	Myceliophthora the
40	668	35.3	310	17	AAW04931	Cellulytic enzyme
41	665	35.1	307	19	AAW44273	Hybrid DNA protein
42	664.5	35.1	308	19	AAW44271	Hybrid DNA protein
43	664	35.0	201	19	AAW53966	Volutella collecto
44	658	34.7	234	19	AAW46618	Humicola insolens
45	657.5	34.7	306	19	AAW44269	Hybrid DNA protein

ALIGNMENTS

RESULT 1
AAB09826
ID AAB09826 standard; Protein; 346 AA.
XX
AC AAB09826;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase protein sequence 6.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff.
XX
OS Phycomyces nitens.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
DR N-PSDB; AAA62731.
XX
PT Endoglucanases of fungal origin with high activity under alkaline
PT conditions for production of paper pulp and animal feedstuffs -

XX
PS Claim 44; Page 130-132; 180pp; Japanese.
XX
CC This sequence represents an endoglucanase protein. The invention relates
CC to an endoglucanase of fungal origin which can completely break down
CC purified cellulose at a concentration of less than 1mg protein/litre,
CC and produces more than 50% breakdown of cellulose at pH 8.5. The
CC invention includes endoglucanase protein sequences (see
CC AAB09825-B09830), endoglucanase nucleotide sequences (see
CC AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC identification of the endoglucanase sequences, and in the construction of
CC vectors containing the polynucleotides. The endoglucanase enzymes are
CC used for the production of pulp for papermaking and for the production of
CC animal foodstuffs.
XX
SQ Sequence 346 AA;

Query Match 100.0%; Score 1895; DB 21; Length 346;
Best Local Similarity 100.0%; Pred. No. 1e-138;
Matches 346; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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Qy          1 MKFSIIASALLLAASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQCIP 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 MKFSIIASALLLAASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQCIP 60

Qy         61 NDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTT 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 NDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTT 120

Qy        121 TKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSR 180
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        121 TKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSR 180

Qy        181 LGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAV 240
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        181 LGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAV 240

Qy        241 AGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISEC 300
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        241 AGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISEC 300

Qy        301 DKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              |||||||||||||||||||||||||||||||||||||||||||||
Db        301 DKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
```

RESULT 2
AAO15057
ID AAO15057 standard; Protein; 346 AA.
XX
AC AAO15057;
XX
DT 22-AUG-2002 (first entry)
XX
DE Phycomyces nitens endoglucanase-related protein.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp.
XX
OS Phycomyces nitens.
XX
PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR N-PSDB; AAL43249.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Claim 5; Page 79-80; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present amino acid sequence represents an endoglucanase-related
CC protein of the invention.
XX
SQ Sequence 346 AA;

Query Match 100.0%; Score 1895; DB 23; Length 346;
Best Local Similarity 100.0%; Pred. No. 1e-138;
Matches 346; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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Qy          1 MKFSIIASALLLAASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQCIP 60
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Db          1 MKFSIIASALLLAASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQCIP 60

Qy         61 NDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTT 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 NDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTT 120

Qy        121 TKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSR 180
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        121 TKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSR 180

Qy        181 LGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAV 240
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        181 LGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAV 240

Qy        241 AGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISEC 300
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        241 AGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISEC 300

Qy        301 DKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              |||||||||||||||||||||||||||||||||||||||||||||
Db        301 DKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
```

RESULT 3
ABB08065
ID ABB08065 standard; protein; 346 AA.
XX
AC ABB08065;
XX
DT 27-AUG-2002 (first entry)
XX
DE P. nitens CP99002 PCEI protein.
XX
KW Cellulase; endoglucanase; surfactant; detergent; cellulose; paper;
KW pulp treatment; PCEI.
XX
OS Phycomyces nitens.
XX
FH Key Location/Qualifiers
FT Peptide 1..19
FT /note= "signal peptide"
FT Protein 20..346
FT /note= "mature protein"
XX
PN WO200238754-A1.
XX

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PD   16-MAY-2002.
XX
PF   12-NOV-2001; 2001WO-JP09858.
XX
PR   10-NOV-2000; 2000JP-0343921.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Koga J,  Nakane A,  Baba Y,  Kono T;
XX
DR   WPI; 2002-471555/50.
XX
PT   Cellulase preparations containing transconjugant-originated
PT   endoglucanase and non-ionic surfactants, useful in detergent
PT   compositions, in treating cellulose fibers and deinking waste paper and
PT   improving freeness of paper pulp  -
XX
PS   Claim 3; Page 32-33; 38pp; Japanese.
XX
CC   The invention relates to a cellulase preparation comprising a
CC   transconjugant-originated endoglucanase and a non-ionic surfactant. The
CC   endoglucanase is selected from RCEI, RCEII, RCEII, MCEI, MCEII or PCEI
CC   proteins. The preparations are useful in detergent compositions, in
CC   treating cellulose fibers and deinking waste paper and improving the
CC   freeness of paper pulp. The fibers treated by the preparations have
CC   reduced feathering and improved skin-feel and appearance with colour
CC   clarification, local change in colour and softening, and after deinking
CC   and paper pulp treatment, there is an improvement on freeness of the
CC   paper pulp. This treatment with the cellulase preparation can be operated
CC   at significantly lower cost. The present sequence represents the
CC   P. nitens CP99002 PCEI protein.
XX
SQ   Sequence   346 AA;

  Query Match             100.0%;  Score 1895;  DB 23;  Length 346;
  Best Local Similarity   100.0%;  Pred. No. 1e-138;
  Matches  346;  Conservative    0;  Mismatches    0;  Indels    0;  Gaps    0;

Qy          1 MKFSIIASALLLAASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQCIP 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 MKFSIIASALLLAASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQCIP 60

Qy         61 NDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTT 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 NDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTT 120

Qy        121 TKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSR 180
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        121 TKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSR 180

Qy        181 LGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAV 240
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        181 LGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAV 240

Qy        241 AGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISEC 300
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        241 AGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISEC 300

Qy        301 DKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              ||||||||||||||||||||||||||||||||||||||||||||||
Db        301 DKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346


RESULT 4
AAB09824
ID   AAB09824 standard; Protein; 338 AA.
XX
AC   AAB09824;
XX
DT   25-SEP-2000  (first entry)
XX
DE   Endoglucanase protein sequence 4.
XX
KW   Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW   animal foodstuff.
XX
OS   Mucor circinelloides.
XX
PN   WO200024879-A1.
XX
PD   04-MAY-2000.
XX
PF   25-OCT-1999;   99WO-JP05884.
XX
PR   23-OCT-1998;   98JP-0302387.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakamura Y,  Moriya T,  Baba Y,  Yanai K,  Sumida N,  Nishimura T;
PI   Murashima K,  Nakane A,  Yaguchi T,  Koga J,  Murakami T,  Kono T;
XX
DR   WPI; 2000-365117/31.
DR   N-PSDB; AAA62729.
XX
PT   Endoglucanases of fungal origin with high activity under alkaline
PT   conditions for production of paper pulp and animal feedstuffs  -
XX
PS   Claim 44; Page 120-122; 180pp; Japanese.
XX
CC   This sequence represents an endoglucanase protein. The invention relates
CC   to an endoglucanase of fungal origin which can completely break down
CC   purified cellulose at a concentration of less than 1mg protein/litre,
CC   and produces more than 50% breakdown of cellulose at pH 8.5. The
CC   invention includes endoglucanase protein sequences (see
CC   AAB09825-B09830), endoglucanase nucleotide sequences (see
CC   AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC   identification of the endoglucanase sequences, and in the construction of
CC   vectors containing the polynucleotides. The endoglucanase enzymes are
CC   used for the production of pulp for papermaking and for the production of
CC   animal foodstuffs.
XX
SQ   Sequence   338 AA;

  Query Match             63.2%;  Score 1197;  DB 21;  Length 338;
  Best Local Similarity   61.8%;  Pred. No. 1.1e-84;
  Matches  217;  Conservative   45;  Mismatches   71;  Indels   18;  Gaps    5;

Qy          1 MKFSIIASALLLA---ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQ 57
              |||::  ::: :|   :||  || ||  ||||||  |:||||| || |||  | |::|||
Db          1 MKFTVAITSIAVALALSSSAEAASCSSVYGQCGGIGWSGPTCCESGSTCVAQEGNKYYSQ 60

Qy         58 CIPNDQVQ--GNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTT 115
              |:|       ||  :|  |:|| :|      || ||| | |||   | ||    ||||||
Db         61 CLPGSHSNNAGNASSTKKTSTKTST------TTAKATATVTTK---TVTK----TTTKTT 107

Qy        116 TKTTTTKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAK 175
              |||:|| ||:|::||: ||  |||| ||:| ||||||||| ||:| |||||| || |||
Db        108 TKTSTTAAASTSTSSSAGYKVISGGKSGSGSTTRYWDCCKASCSWPGKASVTGPVDTCAS 167

Qy        176 DGVSRLGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTF 235
              :|:| | :: |||| ||  :|||:|||| |||:|||||||||:  :  : :|||||||||
Db        168 NGISLLDANAQSGCNGGNGFMCNNNQPWAVNDELAYGFAAASIAGSNEAGWCCGCYELTF 227

Qy        236 TNTAVAGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGIS 295
              |: | :||| |||||||| || :||||||||||||| |||| :||    |||||||||:|
Db        228 TSGAASGKKMVVQVTNTGGDLGSNHFDLQMPGGGVGIFNGCAAQWGAPNDGWGARYGGVS 287

Qy        296 SISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
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Db        288 SVSDCASLPSALQAGCKWRFNWFKNSDNPTMTFKEVTCPAELTTRSGCERK 338


RESULT 5
AAO15055
ID   AAO15055 standard; Protein; 338 AA.
XX
```

```
AC   AAO15055;
XX
DT   22-AUG-2002  (first entry)
XX
DE   Rhizopus arrhizus endoglucanase-related protein 4.
XX
KW   Zygomycetes-originated endoglucanase; cellulose binding domain;
KW   fibre processing; waste paper de-inking; paper pulp.
XX
OS   Mucor circinelloides.
XX
PN   WO200242474-A1.
XX
PD   30-MAY-2002.
XX
PF   21-NOV-2001; 2001WO-JP10188.
XX
PR   21-NOV-2000; 2000JP-0354296.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakane A,  Baba Y,  Koga J,  Kubota H;
XX
DR   WPI; 2002-471729/50.
DR   N-PSDB; AAL43247.
XX
PT   Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT   with effect of endoglucanase activity enhanced in processing fibers,
PT   deinking waste paper and improving freeness of paper pulp  -
XX
PS   Claim 5; Page 68-70; 109pp; Japanese.
XX
CC   The invention comprises the amino acid and coding sequences of
CC   zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC   binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC   invention have enhanced endoglucanase activity. The zygomycetes-
CC   originated endoglucanase enzymes of the invention are useful for
CC   processing fibres, de-inking waste paper and improving the freeness of
CC   paper pulp - which is particularly applicable in detergent compositions.
CC   The present amino acid sequence represents an endoglucanase-related
CC   protein of the invention.
XX
SQ   Sequence   338 AA;

  Query Match             63.2%;  Score 1197;  DB 23;  Length 338;
  Best Local Similarity   61.8%;  Pred. No. 1.1e-84;
  Matches  217;  Conservative   45;  Mismatches   71;  Indels   18;  Gaps    5;

Qy          1 MKFSIIASALLLA---ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQ 57
              |||::  ::: :|   :||  || ||  |||||| |:||||| || ||| | |::|||
Db          1 MKFTVAITSIAVALALSSSAEAASCSSVYGQCGGIGWSGPTCCESGSTCVAQEGNKYYSQ 60

Qy         58 CIPNDQVQ--GNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTT 115
              |:|      ||  :|  |:|| :|      || ||| | |||   | ||    ||||||
Db         61 CLPGSHSNNAGNASSTKKTSTKTST------TTAKATATVTTK---TVTK----TTTKTT 107

Qy        116 TKTTTTKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAK 175
              |||:|| ||:|::||: ||  |||| ||:| ||||||||| ||:| |||||| || |||
Db        108 TKTSTTAAASTSTSSSAGYKVISGGKSGSGSTTRYWDCCKASCSWPGKASVTGPVDTCAS 167

Qy        176 DGVSRLGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTF 235
              :|:| | :: |||| ||  :|||:|||| |||:|||||||||:  :  : :|||||||||
Db        168 NGISLLDANAQSGCNGGNGFMCNNNQPWAVNDELAYGFAAASIAGSNEAGWCCGCYELTF 227

Qy        236 TNTAVAGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGIS 295
              |: | :||| |||||||| || :||||||||||||| |||| :||    |||||||||:|
Db        228 TSGAASGKKMVVQVTNTGGDLGSNHFDLQMPGGGVGIFNGCAAQWGAPNDGWGARYGGVS 287

Qy        296 SISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              |:|:|  ||: ||||||||| ||||:||| :||| ||||||:  ::|||||
Db        288 SVSDCASLPSALQAGCKWRFNWFKNSDNPTMTFKEVTCPAELTTRSGCERK 338
```

```
RESULT 6
ABB08063
ID   ABB08063 standard; protein; 338 AA.
XX
AC   ABB08063;
XX
DT   27-AUG-2002  (first entry)
XX
DE   M. circinelloides CP99001 MCEI protein.
XX
KW   Cellulase; endoglucanase; surfactant; detergent; cellulose; paper;
KW   pulp treatment; MCEI.
XX
OS   Mucor circinelloides.
XX
FH   Key             Location/Qualifiers
FT   Peptide         1..22
FT                   /note= "signal peptide"
FT   Protein         23..338
FT                   /note= "mature protein"
XX
PN   WO200238754-A1.
XX
PD   16-MAY-2002.
XX
PF   12-NOV-2001; 2001WO-JP09858.
XX
PR   10-NOV-2000; 2000JP-0343921.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Koga J,  Nakane A,  Baba Y,  Kono T;
XX
DR   WPI; 2002-471555/50.
XX
PT   Cellulase preparations containing transconjugant-originated
PT   endoglucanase and non-ionic surfactants, useful in detergent
PT   compositions, in treating cellulose fibers and deinking waste paper and
PT   improving freeness of paper pulp  -
XX
PS   Claim 3; Page 27-29; 38pp; Japanese.
XX
CC   The invention relates to a cellulase preparation comprising a
CC   transconjugant-originated endoglucanase and a non-ionic surfactant. The
CC   endoglucanase is selected from RCEI, RCEII, RCEII, MCEI, MCEII or PCEI
CC   proteins. The preparations are useful in detergent compositions, in
CC   treating cellulose fibers and deinking waste paper and improving the
CC   freeness of paper pulp. The fibers treated by the preparations have
CC   reduced feathering and improved skin-feel and appearance with colour
CC   clarification, local change in colour and softening, and after deinking
CC   and paper pulp treatment, there is an improvement on freeness of the
CC   paper pulp. This treatment with the cellulase preparation can be operated
CC   at significantly lower cost. The present sequence represents the
CC   M. circinelloides CP99001 MCEI protein.
XX
SQ   Sequence   338 AA;

  Query Match             63.2%;  Score 1197;  DB 23;  Length 338;
  Best Local Similarity   61.8%;  Pred. No. 1.1e-84;
  Matches  217;  Conservative   45;  Mismatches   71;  Indels   18;  Gaps    5;

Qy          1 MKFSIIASALLLA---ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQ 57
              |||::  ::: :|   :||  || ||  |||||| |:||||| || ||| | |::|||
Db          1 MKFTVAITSIAVALALSSSAEAASCSSVYGQCGGIGWSGPTCCESGSTCVAQEGNKYYSQ 60

Qy         58 CIPNDQVQ--GNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTT 115
              |:|      ||  :|  |:|| :|      || ||| | |||   | ||    ||||||
Db         61 CLPGSHSNNAGNASSTKKTSTKTST------TTAKATATVTTK---TVTK----TTTKTT 107

Qy        116 TKTTTTKAATTTSSSNTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAK 175
              |||:|| ||:|::||: ||  |||| ||:| ||||||||| ||:| |||||| || |||
Db        108 TKTSTTAAASTSTSSSAGYKVISGGKSGSGSTTRYWDCCKASCSWPGKASVTGPVDTCAS 167
```

```
Qy        176 DGVSRLGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTF 235
              :|:| | :: |||| || :|||:|||| |||:|||||||||:  :  : :|||||||||
Db        168 NGISLLDANAQSGCNGGNGFMCNNNQPWAVNDELAYGFAAASIAGSNEAGWCCGCYELTF 227

Qy        236 TNTAVAGKKFVVQVTNTGDDLSTNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGIS 295
              |: | :||| |||||||| || :|||||||||||||| |||| :||    |||||||||:|
Db        228 TSGAASGKKMVVQVTNTGGDLGSNHFDLQMPGGGVGIFNGCAAQWGAPNDGWGARYGGVS 287

Qy        296 SISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              |:|:|  ||: |||||||| ||||:||| :||| ||||||:  ::|||||
Db        288 SVSDCASLPSALQAGCKWRFNWFKNSDNPTMTFKEVTCPAELTTRSGCERK 338


RESULT 7
AAB09823
ID   AAB09823 standard; Protein; 360 AA.
XX
AC   AAB09823;
XX
DT   25-SEP-2000  (first entry)
XX
DE   Endoglucanase protein sequence 3.
XX
KW   Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW   animal foodstuff.
XX
OS   Rhizopus oryzae.
XX
PN   WO200024879-A1.
XX
PD   04-MAY-2000.
XX
PF   25-OCT-1999;   99WO-JP05884.
XX
PR   23-OCT-1998;   98JP-0302387.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakamura Y,  Moriya T,  Baba Y,  Yanai K,  Sumida N,  Nishimura T;
PI   Murashima K,  Nakane A,  Yaguchi T,  Koga J,  Murakami T,  Kono T;
XX
DR   WPI; 2000-365117/31.
DR   N-PSDB; AAA62728.
XX
PT   Endoglucanases of fungal origin with high activity under alkaline
PT   conditions for production of paper pulp and animal feedstuffs  -
XX
PS   Claim 44; Page 115-117; 180pp; Japanese.
XX
CC   This sequence represents an endoglucanase protein. The invention relates
CC   to an endoglucanase of fungal origin which can completely break down
CC   purified cellulose at a concentration of less than 1mg protein/litre,
CC   and produces more than 50% breakdown of cellulose at pH 8.5. The
CC   invention includes endoglucanase protein sequences (see
CC   AAB09825-B09830), endoglucanase nucleotide sequences (see
CC   AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC   identification of the endoglucanase sequences, and in the construction of
CC   vectors containing the polynucleotides. The endoglucanase enzymes are
CC   used for the production of pulp for papermaking and for the production of
CC   animal foodstuffs.
XX
SQ   Sequence   360 AA;

  Query Match           63.0%;  Score 1194;  DB 21;  Length 360;
  Best Local Similarity   61.0%;  Pred. No. 2e-84;
  Matches  222;  Conservative   43;  Mismatches   77;  Indels   22;  Gaps    7;

Qy          1 MKFSIIASALLLA----ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYS 56
              |||  |||: :||       :|||||: | ||||| | ||||| || |||   :| :||
Db          1 MKFLTIASSAILALAVGTEMAHAAECSKAYYQCGGKNWDGPTCCESGSTCVDYPDNPFYS 60

Qy         57 QCIPNDQV----QGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKAT-TTTT 111
              ||:||: :    : : ||||| : |  ||||     :| ||||      |||:|:  |||
Db         61 QCVPNENLTSTNKSSHKTTTTESAKKTTTTKG----SKKTTTTEASKKTTTTEASKKTTT 116

Qy        112 TKTTTKTTTT--KAATTTSSS----NTGYSPISGGPSGNGRTTRYWDCCKPSCAWDGKAS 165
              |: : |||||  ||:|:||||    :| || :||| |||| ||||||||||||:| |||
Db        117 TEASKKTTTTTKKASTSTSSSSSSASTNYSAVSGGASGNGETTRYWDCCKPSCSWPGKAD 176

Qy        166 VTKPVLTCAKDGVSRLGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASA 225
              || || :| ||| :   :: |:||||| :| ||||||||:||||||||||:     :
Db        177 VTSPVGSCNKDGKTLADNNTQNGCVGGSSYTCNDNQPWVVSDDLAYGFAAASISGGSEAT 236

Qy        226 FCCGCYELTFTNTAVAGKKFVVQVTNTGDDLSTN---HFDLQMPGGGVGYFNGCQSQWNT 282
              :|| |:|||||:||| ||| |||||||| || :|   ||||||||||| :||| :||
Db        237 WCCACPELTFTSTAVKGKKMVVQVTNTGSDLGSNTGAHFDLQMPGGGVGIYNGCATQWGA 296

Qy        283 NTDGWGARYGGISSISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTG 342
              ||||||||||:|| |:|  ||: ||||||||||||||||| :|:| ||||  | ||:|
Db        297 PTDGWGARYGGVSSASDCSNLPSALQAGCKWRFGWFKNADNPTMTYKQVTCPKAITAKSG 356

Qy        343 CERK 346
              | ||
Db        357 CSRK 360


RESULT 8
AAO15054
ID   AAO15054 standard; Protein; 360 AA.
XX
AC   AAO15054;
XX
DT   22-AUG-2002  (first entry)
XX
DE   Rhizopus arrhizus endoglucanase-related protein 3.
XX
KW   Zygomycetes-originated endoglucanase; cellulose binding domain;
KW   fibre processing; waste paper de-inking; paper pulp.
XX
OS   Rhizopus arrhizus.
XX
PN   WO200242474-A1.
XX
PD   30-MAY-2002.
XX
PF   21-NOV-2001; 2001WO-JP10188.
XX
PR   21-NOV-2000; 2000JP-0354296.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakane A,  Baba Y,  Koga J,  Kubota H;
XX
DR   WPI; 2002-471729/50.
DR   N-PSDB; AAL43246.
XX
PT   Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT   with effect of endoglucanase activity enhanced in processing fibers,
PT   deinking waste paper and improving freeness of paper pulp  -
XX
PS   Claim 5; Page 63-65; 109pp; Japanese.
XX
CC   The invention comprises the amino acid and coding sequences of
CC   zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC   binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC   invention have enhanced endoglucanase activity. The zygomycetes-
CC   originated endoglucanase enzymes of the invention are useful for
CC   processing fibres, de-inking waste paper and improving the freeness of
CC   paper pulp - which is particularly applicable in detergent compositions.
CC   The present amino acid sequence represents an endoglucanase-related
CC   protein of the invention.
XX
SQ   Sequence   360 AA;

  Query Match           63.0%;  Score 1194;  DB 23;  Length 360;
  Best Local Similarity   61.0%;  Pred. No. 2e-84;
```

```
  Matches  222;  Conservative   43;  Mismatches   77;  Indels   22;  Gaps    7;

Qy          1 MKFSIIASALLLA----ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYS 56
              |||  |||: :||        :|||||: | ||||| | ||||| || |||   :| :||
Db          1 MKFLTIASSAILALAVGTEMAHAAECSKAYYQCGGKNWDGPTCCESGSTCVDYPDNPFYS 60

Qy         57 QCIPNDQV----QGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKAT-TTTT 111
              ||:||: :     : : ||||| : |  ||||     :| ||||      |||:|:  |||
Db         61 QCVPNENLTSTNKSSHKTTTTESAKKTTTTKG----SKKTTTTEASKKTTTTEASKKTTT 116

Qy        112 TKTTTKTTTT--KAATTTSSS----NTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKAS 165
              |: : |||||  ||:|:|||||    :| || :||| |||| ||||||||||||:| |||
Db        117 TEASKKTTTTTKKASTSTSSSSSSASTNYSAVSGGASGNGETTRYWDCCKPSCSWPGKAD 176

Qy        166 VTKPVLTCAKDGVSRLGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASA 225
              || || :| ||| :   :: |:|||||:| |||||||||:||||||||||:     :
Db        177 VTSPVGSCNKDGKTLADNNTQNGCVGGSSYTCNDNQPWVVSDDLAYGFAAASISGGSEAT 236

Qy        226 FCCGCYELTFTNTAVAGKKFVVQVTNTGDDLSTN---HFDLQMPGGGVGYFNGCQSQWNT 282
              :|| |:|||||:||| ||| |||||||| || :|  ||||||||||| :||| :||
Db        237 WCCACFELTFTSTAVKGKKMVVQVTNTGSDLGSNTGAHFDLQMPGGGVGIYNGCATQWGA 296

Qy        283 NTDGWGARYGGISSISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTG 342
              ||||||||||:|| |:|  ||: |||||||||||||||||| :|:| |||| | ||:|
Db        297 PTDGWGARYGGVSSASDCSNLPSALQAGCKWRFGWFKNADNPTMTYKQVTCPKAITAKSG 356

Qy        343 CERK 346
              | ||
Db        357 CSRK 360
```

```
RESULT 9
ABB08062
ID   ABB08062 standard; protein; 360 AA.
XX
AC   ABB08062;
XX
DT   27-AUG-2002  (first entry)
XX
DE   R. oryzae CP96001 RCEIII protein.
XX
KW   Cellulase; endoglucanase; surfactant; detergent; cellulose; paper;
KW   pulp treatment; RCEIII.
XX
OS   Rhizopus oryzae.
XX
FH   Key             Location/Qualifiers
FT   Peptide         1..23
FT                   /note= "signal peptide"
FT   Protein         24..360
FT                   /note= "mature protein"
XX
PN   WO200238754-A1.
XX
PD   16-MAY-2002.
XX
PF   12-NOV-2001; 2001WO-JP09858.
XX
PR   10-NOV-2000; 2000JP-0343921.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Koga J,  Nakane A,  Baba Y,  Kono T;
XX
DR   WPI; 2002-471555/50.
XX
PT   Cellulase preparations containing transconjugant-originated
PT   endoglucanase and non-ionic surfactants, useful in detergent
PT   compositions, in treating cellulose fibers and deinking waste paper and
PT   improving freeness of paper pulp  -
XX
PS   Claim 3; Page 25-27; 38pp; Japanese.
XX
CC   The invention relates to a cellulase preparation comprising a
CC   transconjugant-originated endoglucanase and a non-ionic surfactant. The
CC   endoglucanase is selected from RCEI, RCEII, RCEII, MCEI, MCEII or PCEI
CC   proteins. The preparations are useful in detergent compositions, in
CC   treating cellulose fibers and deinking waste paper and improving the
CC   freeness of paper pulp. The fibers treated by the preparations have
CC   reduced feathering and improved skin-feel and appearance with colour
CC   clarification, local change in colour and softening, and after deinking
CC   and paper pulp treatment, there is an improvement on freeness of the
CC   paper pulp. This treatment with the cellulase preparation can be operated
CC   at significantly lower cost. The present sequence represents the
CC   R. oryzae CP96001 RCEIII protein.
XX
SQ   Sequence   360 AA;
```

```
  Query Match             63.0%;  Score 1194;  DB 23;  Length 360;
  Best Local Similarity   61.0%;  Pred. No. 2e-84;
  Matches  222;  Conservative   43;  Mismatches   77;  Indels   22;  Gaps    7;

Qy          1 MKFSIIASALLLA----ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYS 56
              |||  |||: :||        :|||||: | ||||| | ||||| || |||   :| :||
Db          1 MKFLTIASSAILALAVGTEMAHAAECSKAYYQCGGKNWDGPTCCESGSTCVDYPDNPFYS 60

Qy         57 QCIPNDQV----QGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKAT-TTTT 111
              ||:||: :     : : ||||| : |  ||||     :| ||||      |||:|:  |||
Db         61 QCVPNENLTSTNKSSHKTTTTESAKKTTTTKG----SKKTTTTEASKKTTTTEASKKTTT 116

Qy        112 TKTTTKTTTT--KAATTTSSS----NTGYSPISGGFSGNGRTTRYWDCCKPSCAWDGKAS 165
              |: : |||||  ||:|:|||||    :| || :||| |||| ||||||||||||:| |||
Db        117 TEASKKTTTTTKKASTSTSSSSSSASTNYSAVSGGASGNGETTRYWDCCKPSCSWPGKAD 176

Qy        166 VTKPVLTCAKDGVSRLGSDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASA 225
              || || :| ||| :   :: |:|||||:| |||||||||:||||||||||:     :
Db        177 VTSPVGSCNKDGKTLADNNTQNGCVGGSSYTCNDNQPWVVSDDLAYGFAAASISGGSEAT 236

Qy        226 FCCGCYELTFTNTAVAGKKFVVQVTNTGDDLSTN---HFDLQMPGGGVGYFNGCQSQWNT 282
              :|| |:|||||:||| ||| |||||||| || :|  ||||||||||| :||| :||
Db        237 WCCACFELTFTSTAVKGKKMVVQVTNTGSDLGSNTGAHFDLQMPGGGVGIYNGCATQWGA 296

Qy        283 NTDGWGARYGGISSISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTG 342
              ||||||||||:|| |:|  ||: |||||||||||||||||| :|:| |||| | ||:|
Db        297 PTDGWGARYGGVSSASDCSNLPSALQAGCKWRFGWFKNADNPTMTYKQVTCPKAITAKSG 356

Qy        343 CERK 346
              | ||
Db        357 CSRK 360
```

```
RESULT 10
AAB09825
ID   AAB09825 standard; Protein; 387 AA.
XX
AC   AAB09825;
XX
DT   25-SEP-2000  (first entry)
XX
DE   Endoglucanase protein sequence 5.
XX
KW   Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW   animal foodstuff.
XX
OS   Phycomyces nitens.
XX
PN   WO200024879-A1.
XX
PD   04-MAY-2000.
XX
PF   25-OCT-1999;   99WO-JP05884.
XX
PR   23-OCT-1998;   98JP-0302387.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
```

PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
DR N-PSDB; AAA62730.
XX
PT Endoglucanases of fungal origin with high activity under alkaline
PT conditions for production of paper pulp and animal feedstuffs -
XX
PS Claim 44; Page 125-127; 180pp; Japanese.
XX
CC This sequence represents an endoglucanase protein. The invention relates
CC to an endoglucanase of fungal origin which can completely break down
CC purified cellulose at a concentration of less than 1mg protein/litre,
CC and produces more than 50% breakdown of cellulose at pH 8.5. The
CC invention includes endoglucanase protein sequences (see
CC AAB09825-B09830), endoglucanase nucleotide sequences (see
CC AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC identification of the endoglucanase sequences, and in the construction of
CC vectors containing the polynucleotides. The endoglucanase enzymes are
CC used for the production of pulp for papermaking and for the production of
CC animal foodstuffs.
XX
SQ Sequence 387 AA;

Query Match 61.8%; Score 1170.5; DB 21; Length 387;
Best Local Similarity 54.6%; Pred. No. 1.4e-82;
Matches 213; Conservative 51; Mismatches 79; Indels 47; Gaps 4;

```
Qy          1 MKFSIIASALLLA---ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQ 57
              |||::  ::: :|   :||  || ||  ||||||  |||||||:| ||   ::|::|||
Db          1 MKFTVAITSIAVALALSSSAEAASCSSVYGQCGGIGWTGPTCCDAGSTCKAQKDNKYYSQ 60

Qy         58 CIPNDQ----------------------------------VQGN-------PKTTTTTTT 76
              |||  :                                  :||        | : :
Db         61 CIPKPKGSSSSSSCSSVYSQCGGIGWSGPTCCESGSTCVAQEGNKYYSQCLPGSHSNNAG 120

Qy         77 KAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTTTKAATTTSSSNTGYSP 136
               |::| |   |:|| :|||        |||  | ||||||||:|| ||:|::||: ||
Db        121 NASSTKK---TSTKTSTTTAKATATVTTKTVTKTTTKTTTKTSTTAAASTSTSSSAGYKV 177

Qy        137 ISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSRLGSDVQSGCVGGQAYM 196
              |||| ||:| ||||||||| ||:| |||||| || ||| :|:| | :: |||| ||  :|
Db        178 ISGGKSGSGSTTRYWDCCKASCSWPGKASVTGPVDTCASNGISLLDANAQSGCNGGNGFM 237

Qy        197 CNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAVAGKKFVVQVTNTGDDL 256
              ||:|||| |||:|||||||||:  :  : :|||||||||: | :||| |||||||| ||
Db        238 CNNNQPWAVNDELAYGFAAASIAGSNEAGWCCGCYELTFTSGAASGKKMVVQVTNTGGDL 297

Qy        257 STNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISECDKLPTQLQAGCKWRFG 316
               :|||||||||||||| |||| :||    |||||||||:||:|:|  ||: |||||||||
Db        298 GSNHFDLQMPGGGVGIFNGCAAQWGAPNDGWGARYGGVSSVSDCASLPSALQAGCKWRFN 357

Qy        317 WFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              ||||:||| :||| ||||||:  ::|||||
Db        358 WFKNSDNPTMTFKEVTCPAELTTRSGCERK 387
```

RESULT 11
AAO15056
ID AAO15056 standard; Protein; 387 AA.
XX
AC AAO15056;
XX
DT 22-AUG-2002 (first entry)
XX
DE Rhizopus arrhizus endoglucanase-related protein 5.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp.
XX
OS Mucor circinelloides.
XX

PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR N-PSDB; AAL43248.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Claim 5; Page 73-75; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present amino acid sequence represents an endoglucanase-related
CC protein of the invention.
XX
SQ Sequence 387 AA;

Query Match 61.8%; Score 1170.5; DB 23; Length 387;
Best Local Similarity 54.6%; Pred. No. 1.4e-82;
Matches 213; Conservative 51; Mismatches 79; Indels 47; Gaps 4;

```
Qy          1 MKFSIIASALLLA---ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQ 57
              |||::  ::: :|   :||  || ||  ||||||  |||||||:| ||   ::|::|||
Db          1 MKFTVAITSIAVALALSSSAEAASCSSVYGQCGGIGWTGPTCCDAGSTCKAQKDNKYYSQ 60

Qy         58 CIPNDQ----------------------------------VQGN-------PKTTTTTTT 76
              |||  :                                  :||        | : :
Db         61 CIPKPKGSSSSSSCSSVYSQCGGIGWSGPTCCESGSTCVAQEGNKYYSQCLPGSHSNNAG 120

Qy         77 KAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTTTKAATTTSSSNTGYSP 136
               |::| |   |:|| :|||        |||  | ||||||||:|| ||:|::||: ||
Db        121 NASSTKK---TSTKTSTTTAKATATVTTKTVTKTTTKTTTKTSTTAAASTSTSSSAGYKV 177

Qy        137 ISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSRLGSDVQSGCVGGQAYM 196
              |||| ||:| ||||||||| ||:| |||||| || ||| :|:| | :: |||| ||  :|
Db        178 ISGGKSGSGSTTRYWDCCKASCSWPGKASVTGPVDTCASNGISLLDANAQSGCNGGNGFM 237

Qy        197 CNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAVAGKKFVVQVTNTGDDL 256
              ||:|||| |||:|||||||||:  :  : :|||||||||: | :||| |||||||| ||
Db        238 CNNNQPWAVNDELAYGFAAASIAGSNEAGWCCGCYELTFTSGAASGKKMVVQVTNTGGDL 297

Qy        257 STNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISECDKLPTQLQAGCKWRFG 316
               :|||||||||||||| |||| :||    |||||||||:||:|:|  ||: |||||||||
Db        298 GSNHFDLQMPGGGVGIFNGCAAQWGAPNDGWGARYGGVSSVSDCASLPSALQAGCKWRFN 357

Qy        317 WFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              ||||:||| :||| ||||||:  ::|||||
Db        358 WFKNSDNPTMTFKEVTCPAELTTRSGCERK 387
```

RESULT 12
ABB08064
ID ABB08064 standard; protein; 387 AA.
XX
AC ABB08064;
XX
DT 27-AUG-2002 (first entry)

XX
DE M. circinelloides CP99001 MCEII protein.
XX
KW Cellulase; endoglucanase; surfactant; detergent; cellulose; paper;
KW pulp treatment; MCEII.
XX
OS Mucor circinelloides.
XX
FH Key Location/Qualifiers
FT Peptide 1..22
FT /note= "signal peptide"
FT Protein 23..387
FT /note= "mature protein"
XX
PN WO200238754-A1.
XX
PD 16-MAY-2002.
XX
PF 12-NOV-2001; 2001WO-JP09858.
XX
PR 10-NOV-2000; 2000JP-0343921.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Koga J, Nakane A, Baba Y, Kono T;
XX
DR WPI; 2002-471555/50.
XX
PT Cellulase preparations containing transconjugant-originated
PT endoglucanase and non-ionic surfactants, useful in detergent
PT compositions, in treating cellulose fibers and deinking waste paper and
PT improving freeness of paper pulp -
XX
PS Claim 3; Page 29-31; 38pp; Japanese.
XX
CC The invention relates to a cellulase preparation comprising a
CC transconjugant-originated endoglucanase and a non-ionic surfactant. The
CC endoglucanase is selected from RCEI, RCEII, RCEII, MCEI, MCEII or PCEI
CC proteins. The preparations are useful in detergent compositions, in
CC treating cellulose fibers and deinking waste paper and improving the
CC freeness of paper pulp. The fibers treated by the preparations have
CC reduced feathering and improved skin-feel and appearance with colour
CC clarification, local change in colour and softening, and after deinking
CC and paper pulp treatment, there is an improvement on freeness of the
CC paper pulp. This treatment with the cellulase preparation can be operated
CC at significantly lower cost. The present sequence represents the
CC M. circinelloides CP99001 MCEII protein.
XX
SQ Sequence 387 AA;

Query Match 61.8%; Score 1170.5; DB 23; Length 387;
Best Local Similarity 54.6%; Pred. No. 1.4e-82;
Matches 213; Conservative 51; Mismatches 79; Indels 47; Gaps 4;

```
Qy          1 MKFSIIASALLLA---ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYSQ 57
              |||::  ::: :|   :||  || ||  ||||||  ||||||| :| ||   ::|::|||
Db          1 MKFTVAITSIAVALALSSSAEAASCSSVYGQCGGIGWTGPTCCDAGSTCKAQKDNKYYSQ 60

Qy         58 CIPNDQ---------------------------------VQGN-------PKTTTTTTT 76
              |||  :                                 :||       | : :
Db         61 CIPKPKGSSSSSSCSSVYSQCGGIGWSGPTCCESGSTCVAQEGNKYYSQCLPGSHSNNAG 120

Qy         77 KAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTTKTTTTKAATTTSSSNTGYSP 136
               |::| |   |:|| :|||      |||  | |||||||||:|| ||:|::||: ||
Db        121 NASSTKK---TSTKTSTTTAKATATVTTKTVTKTTTKTTTKTSTTAAASTSTSSSAGYKV 177

Qy        137 ISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLTCAKDGVSRLGSDVQSGCVGGQAYM 196
              |||| ||:| |||||||||| ||:| |||||| || ||| :|:| | :: |||| ||  :|
Db        178 ISGGKSGSGSTTRYWDCCKASCSWPGKASVTGPVDTCASNGISLLDANAQSGCNGGNGFM 237

Qy        197 CNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCYELTFTNTAVAGKKFVVQVTNTGDDL 256
              ||:|||| |||:|||||||||:  :  : :|||||||||: | :||| |||||||| ||
Db        238 CNNNQPWAVNDELAYGFAAASIAGSNEAGWCCGCYELTFTSGAASGKKMVVQVTNTGGDL 297
```

```
Qy        257 STNHFDLQMPGGGVGYFNGCQSQWNTNTDGWGARYGGISSISECDKLPTQLQAGCKWRFG 316
              :|||||||||||||| |||| :||   |||||||||:||:|:|  ||: |||||||||
Db        298 GSNHFDLQMPGGGVGIFNGCAAQWGAPNDGWGARYGGVSSVSDCASLPSALQAGCKWRFN 357

Qy        317 WFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              ||||:||| :||| ||||||:  ::|||||
Db        358 WFKNSDNPTMTFKEVTCPAELTTRSGCERK 387
```

RESULT 13
AAB09821
ID AAB09821 standard; Protein; 338 AA.
XX
AC AAB09821;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase protein sequence 1.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
DR N-PSDB; AAA62726.
XX
PT Endoglucanases of fungal origin with high activity under alkaline
PT conditions for production of paper pulp and animal feedstuffs -
XX
PS Claim 44; Page 106-108; 180pp; Japanese.
XX
CC This sequence represents an endoglucanase protein. The invention relates
CC to an endoglucanase of fungal origin which can completely break down
CC purified cellulose at a concentration of less than 1mg protein/litre,
CC and produces more than 50% breakdown of cellulose at pH 8.5. The
CC invention includes endoglucanase protein sequences (see
CC AAB09825-B09830), endoglucanase nucleotide sequences (see
CC AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC identification of the endoglucanase sequences, and in the construction of
CC vectors containing the polynucleotides. The endoglucanase enzymes are
CC used for the production of pulp for papermaking and for the production of
CC animal foodstuffs.
XX
SQ Sequence 338 AA;

Query Match 58.4%; Score 1106; DB 21; Length 338;
Best Local Similarity 59.8%; Pred. No. 1.2e-77;
Matches 214; Conservative 35; Mismatches 77; Indels 32; Gaps 9;

```
Qy          1 MKFSIIASALLLA----ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYS 56
              |||  |||: |||      |||||: ||||||| | ||||| || ||    :|::||
Db          1 MKFITIASSALLALALGTEMASAAECSKLYGQCGGKNWNGPTCCESGSTC--KVSNDYYS 58

Qy         57 QCIPNDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTT 116
              ||:|:    ||                |:  :  | |||    |   ||| |   |||
Db         59 QCLPSGS-SGN--------------KSSESAHKKTTTAAHKK--TTTAAHKKTTTAPAK 100

Qy        117 KTTTTKAATT---TSSSNTG-YSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLT 172
```

```
Db        101 KTTTVAKASTPSNSSSSSSGKYSAVSGGASGNGVTTRYWDCCKASCSWPGKANVSSPVKS 160

Qy        173 CAKDGVSRLG-SDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCY 231
              | ||||: |  |: |||| || :||||||||| |||:|||||||::   | | :|| |:
Db        161 CNKDGVTALSDSNAQSGCNGGNSYMCNDNQPWAVNDNLAYGFAAAAISGGGESRWCCSCF 220

Qy        232 ELTFTNTAVAGKKFVVQVTNTGDDLSTN---HFDLQMPGGGVGYFNGCQSQWNTNTDGWG 288
              |||||:|:||||| |||||||| || ::   |||||||||||| |||| |||    ||||
Db        221 ELTFTSTSVAGKKMVVQVTNTGGDLGSSTGAHFDLQMPGGGVGIFNGCSSQWGAPNDGWG 280

Qy        289 ARYGGISSISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              :||||||| |:|  ||: |||||||| |||||||| :|:| |||| || ||||| ||
Db        281 SRYGGISSASDCSSLPSALQAGCKWRFNWFKNADNPSMTYKEVTCPKEITAKTGCSRK 338
```

RESULT 14
AAO15052
ID AAO15052 standard; Protein; 338 AA.
XX
AC AAO15052;
XX
DT 22-AUG-2002 (first entry)
XX
DE Rhizopus arrhizus endoglucanase-related protein 1.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp.
XX
OS Rhizopus arrhizus.
XX
PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR N-PSDB; AAL43244, AAL43250.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Claim 5; Page 54-55; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present amino acid sequence represents an endoglucanase-related
CC protein of the invention.
XX
SQ Sequence 338 AA;

Query Match 58.4%; Score 1106; DB 23; Length 338;
Best Local Similarity 59.8%; Pred. No. 1.2e-77;
Matches 214; Conservative 35; Mismatches 77; Indels 32; Gaps 9;

```
Qy          1 MKFSIIASALLLA----ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYS 56
              ||| |||: |||        |||||: ||||||| | ||||| || ||    :|::||
Db          1 MKFITIASSALLALALGTEMASAAECSKLYGQCGGKNWNGPTCCESGSTC--KVSNDYYS 58

Qy         57 QCIPNDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTT 116
```

```
              ||:|:    ||              |:  :  | |||   |   ||| |   |||
Db         59 QCLPSGS-SGN--------------KSSESAHKKTTTAAHKK--TTTAAHKKTTTAPAK 100

Qy        117 KTTTTKAATT---TSSSNTG-YSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLT 172
              ||||   |:|   :|||::| || :||| |||| |||||||||| ||:| |||:|: || :
Db        101 KTTTVAKASTPSNSSSSSSGKYSAVSGGASGNGVTTRYWDCCKASCSWPGKANVSSPVKS 160

Qy        173 CAKDGVSRLG-SDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAASLGSAGASAFCCGCY 231
              | ||||: |  |: |||| || :||||||||| |||:|||||||::   | | :|| |:
Db        161 CNKDGVTALSDSNAQSGCNGGNSYMCNDNQPWAVNDNLAYGFAAAAISGGGESRWCCSCF 220

Qy        232 ELTFTNTAVAGKKFVVQVTNTGDDLSTN---HFDLQMPGGGVGYFNGCQSQWNTNTDGWG 288
              |||||:|:||||| |||||||| || ::   |||||||||||| |||| |||    ||||
Db        221 ELTFTSTSVAGKKMVVQVTNTGGDLGSSTGAHFDLQMPGGGVGIFNGCSSQWGAPNDGWG 280

Qy        289 ARYGGISSISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              :||||||| |:|  ||: |||||||| |||||||| :|:| |||| || ||||| ||
Db        281 SRYGGISSASDCSSLPSALQAGCKWRFNWFKNADNPSMTYKEVTCPKEITAKTGCSRK 338
```

RESULT 15
ABB08060
ID ABB08060 standard; protein; 338 AA.
XX
AC ABB08060;
XX
DT 27-AUG-2002 (first entry)
XX
DE R. oryzae CP96001 RCEI protein.
XX
KW Cellulase; endoglucanase; surfactant; detergent; cellulose; paper;
KW pulp treatment; RCEI.
XX
OS Rhizopus oryzae.
XX
FH Key Location/Qualifiers
FT Peptide 1..23
FT /note= "signal peptide"
FT Protein 24..338
FT /note= "mature protein"
XX
PN WO200238754-A1.
XX
PD 16-MAY-2002.
XX
PF 12-NOV-2001; 2001WO-JP09858.
XX
PR 10-NOV-2000; 2000JP-0343921.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Koga J, Nakane A, Baba Y, Kono T;
XX
DR WPI; 2002-471555/50.
XX
PT Cellulase preparations containing transconjugant-originated
PT endoglucanase and non-ionic surfactants, useful in detergent
PT compositions, in treating cellulose fibers and deinking waste paper and
PT improving freeness of paper pulp -
XX
PS Claim 3; Page 21-22; 38pp; Japanese.
XX
CC The invention relates to a cellulase preparation comprising a
CC transconjugant-originated endoglucanase and a non-ionic surfactant. The
CC endoglucanase is selected from RCEI, RCEII, RCEII, MCEI, MCEII or PCEI
CC proteins. The preparations are useful in detergent compositions, in
CC treating cellulose fibers and deinking waste paper and improving the
CC freeness of paper pulp. The fibers treated by the preparations have
CC reduced feathering and improved skin-feel and appearance with colour
CC clarification, local change in colour and softening, and after deinking
CC and paper pulp treatment, there is an improvement on freeness of the
CC paper pulp. This treatment with the cellulase preparation can be operated
CC at significantly lower cost. The present sequence represents the

CC R. oryzae CP96001 RCEI protein.
XX
SQ Sequence 338 AA;

Query Match 58.4%; Score 1106; DB 23; Length 338;
Best Local Similarity 59.8%; Pred. No. 1.2e-77;
Matches 214; Conservative 35; Mismatches 77; Indels 32; Gaps 9;

```
Qy          1 MKFSIIASALLLA----ASSTYAAECSQGYGQCGGKMWTGPTCCTSGFTCVGAENNEWYS 56
              |||  |||: |||          |||||: ||||||| | ||||| || ||    :|::||
Db          1 MKFITIASSALLALALGTEMASAAECSKLYGQCGGKNWNGPTCCESGSTC--KVSNDYYS 58

Qy         57 QCIPNDQVQGNPKTTTTTTTKAATTTKAPVTTTKATTTTTTKAPVTTTKATTTTTTKTTT 116
              ||:|:    ||              |:  :  | |||   |   ||| |   |||
Db         59 QCLPSGS-SGN--------------KSSESAHKKTTTAAHKK--TTTAAHKKTTTAPAK 100

Qy        117 KTTTTKAATT---TSSSNTG-YSPISGGFSGNGRTTRYWDCCKPSCAWDGKASVTKPVLT 172
              ||||   |:|   :|||::| || :||| |||| ||||||||| ||:| |||:|: || :
Db        101 KTTTVAKASTPSNSSSSSSGKYSAVSGGASGNGVTTRYWDCCKASCSWPGKANVSSPVKS 160

Qy        173 CAKDGVSRLG-SDVQSGCVGGQAYMCNDNQPWVVNDDLAYGFAAAASLGSAGASAFCCGCY 231
              | ||||: |  |: |||| || :|||||||| |||:||||||::   | | :|| |:
Db        161 CNKDGVTALSDSNAQSGCNGGNSYMCNDNQPWAVNDNLAYGFAAAAISGGGESRWCCSCF 220

Qy        232 ELTFTNTAVAGKKFVVQVTNTGDDLSTN---HFDLQMPGGGVGYFNGCQSQWNTNTDGWG 288
              |||||:|:||||| |||||||| || ::   |||||||||||| |||| |||    ||||
Db        221 ELTFTSTSVAGKKMVVQVTNTGGDLGSSTGAHFDLQMPGGGVGIFNGCSSQWGAPNDGWG 280

Qy        289 ARYGGISSISECDKLPTQLQAGCKWRFGWFKNADNPEVTFKAVTCPAEIIAKTGCERK 346
              :|||||||| |:|  ||: ||||||||| |||||||| :|:| |||| || ||||| ||
Db        281 SRYGGISSASDCSSLPSALQAGCKWRFNWFKNADNPSMTYKEVTCPKEITAKTGCSRK 338
```

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Job time : 38.9222 secs